



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,662	01/28/2002	Ryoichi Mukai	2500.66134	3822

7590 06/27/2005

Patrick G. Burns, Esq.  
GREER, BURNS & CRAIN, LTD.  
Suite 2500  
300 South Wacker Dr.  
Chicago, IL 60606

EXAMINER
----------

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
----------	--------------

1771

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/058,662

Applicant(s)

MUKAI, RYOICHI

Examiner

Andrew T. Piziali

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/13/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on 5/26/2005 has been entered. The examiner has withdrawn the previous objection to the drawings in view of the submitted formal drawings, but the new drawings necessitated a new objection to the drawings. The examiner has withdrawn the 35 USC 112 rejections of claims 1-6 based on the amendment to claim 1. Applicant's amendment necessitated the new grounds of rejection presented in this Office action.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character not mentioned in the description: Reference character 31a is not mentioned in the specification (see the paragraph bridging pages 8 and 9), rather, reference character 31 is used to describe the Co atoms. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102/103***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2 and 18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 5,162,158 to Christner et al. (hereinafter referred to as Christner).

Regarding claims 1-2 and 18, Christner discloses a polycrystalline structure film comprising metallic nucleation sites (43) formed on a surface of a substrate and physically separated from adjacent ones of said nucleation sites, said metallic nucleation sites including a compound (a combination of elements is considered a compound), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains (36, 38, 40 and 42) having grown from the metallic nucleation sites (see entire document including Figure 3, column 3, lines 24-61 and column 5, lines 52-64).

Regarding claim 2, Christner discloses that the metallic nucleation sites (43) may consist of a combination of metallic elements (column 5, lines 52-64).

Regarding claim 18, Christner discloses that each of the crystal grains (36, 38, 40 and 42) corresponds to a respective one of the metallic nucleation sites (43) (Figure 3).

***Claim Rejections - 35 USC § 103***

6. Claims 1-4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,631,094 to Ranjan et al. (hereinafter referred to as Ranjan) in view of USPN 5,162,158 to Christner.

Regarding claims 1-4 and 18, Ranjan discloses a polycrystalline structure film comprising metallic nucleation sites formed on a surface of a substrate wherein said metallic nucleation sites include a compound ( $\text{Al}_2\text{O}_3$ ), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains having grown from the metallic nucleation sites (see entire document including column 6, lines 10-42).

Ranjan discloses that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 12-14, 41-44 and 59-65), but Ranjan does not specifically disclose how to separate the grains of the nucleation layer. Ranjan is silent with regards to specific method for spacing the grains, therefore, it would have been obvious to look to the prior art for conventional methods. Christner provides this conventional teaching showing that it is known in the art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the grains of Ranjan by spacing the underlying nucleation sites, as taught by Christner, motivated by the expectation of successfully practicing the invention of Ranjan.

Art Unit: 1771

Regarding claims 2-4, Ranjan discloses that the compound may be  $\text{Al}_2\text{O}_3$  (column 6, lines 10-28).

Regarding claim 18, Christner discloses that each of the crystal grains (36, 38, 40 and 42) corresponds to a respective one of the metallic nucleation sites (43) (Figure 3).

7. Claims 1-2 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen et al. (hereinafter referred to as Chen) in view of USPN 5,162,158 to Christner.

Regarding claims 1-2 and 18, Chen discloses a polycrystalline structure film comprising metallic nucleation sites (76) formed on a surface of a substrate wherein said metallic nucleation sites including a compound (an alloy is considered a compound), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains (78) having grown from the metallic nucleation sites (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-26, column 11, lines 11-22 and column 16, lines 9-46).

Chen does not appear to teach that the nucleation sites are physically separated, but Chen does disclose that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Christner discloses that it is known in the art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the grains of Chen by spacing the underlying nucleation sites, as taught by Christner, because the noise of interparticle exchange interaction could be reduced.

Regarding claim 2, Chen discloses that the metallic nucleation sites (76) may consist of a combination of metallic elements (an alloy) (column 11, lines 11-22).

Regarding claim 18, Chen discloses that each of the crystal grains (78) corresponds to a respective one of the metallic nucleation sites (76) (Figure 2).

8. Claims 1-6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 5,162,158 to Christner in view of USPN 6,150,015 to Bertero et al. (hereinafter referred to as Bertero).

Regarding claims 1-6 and 18, Chen discloses a polycrystalline structure film comprising metallic nucleation sites (76) formed on a surface of a substrate wherein said metallic nucleation sites including a compound (an alloy is considered a compound), and a metallic crystal layer covering over the surface of the substrate and containing crystal grains (78) having grown from the metallic nucleation sites (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-26, column 11, lines 11-22 and column 16, lines 9-46).

Chen does not appear to teach that the nucleation sites are physically separated, but Chen does disclose that the noise of interparticle exchange interaction can be reduced by spacing the grains of the magnetic layer (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Christner discloses that it is known in the art to space the nucleation sites to result in spaced grains (see entire document including Figure 3 and column 3, lines 24-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the grains of Chen by spacing the underlying nucleation sites, as taught by Christner, because the noise of interparticle exchange interaction can be reduced.

In the event that it is determined that an alloy is not considered a compound, it is noted that Chen discloses that the nucleation sites may be formed of any material that allows for the epitaxial growth of the Co-based recording layer (column 11, lines 10-22). Bertero discloses that the most ideal material choice for a nucleation layer is the same composition used for the magnetic layer (column 13, lines 40-42). Considering that Chen discloses that the magnetic layer may comprise a magnetic material together with a compound such as an oxide or nitride of silicon or aluminum (column 11, lines 56-62), it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nucleation layer with the same composition used for the magnetic layer, because Bertero discloses that this is material is ideal for epitaxial growth of the magnetic layer and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability.

Regarding claims 2-4, Chen discloses that the compound may be  $\text{Si}_3\text{N}_4$ ,  $\text{SiO}_2$  or  $\text{Al}_2\text{O}_3$  (column 11, lines 57-62).

Regarding claim 5, Chen discloses that platinum may be present in the magnetic layer (column 15, lines 5-10). Considering that it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nucleation layer with the same composition used for the magnetic layer (as explained above), the nucleation layer would also contain platinum.

Regarding claim 6, Chen discloses that the compound may be added at about or below 10 molar percent (column 12, lines 12-28).

Regarding claim 18, Chen discloses that each of the crystal grains (78) corresponds to a respective one of the metallic nucleation sites (76) (Figure 2).



*Response to Arguments*

9. Applicant's arguments with respect to the claims have been considered but are primarily moot in view of the new grounds of rejection.

The applicant asserts that an alloy is not a compound. The examiner respectfully disagrees. The definition of a "compound" is "A combination of two or more elements or parts." The definition of an "alloy" is "A homogeneous mixture or solid solution of two or more metals, the atoms of one replacing or occupying interstitial positions between the atoms of the other." Clearly, an alloy is a compound.

Regarding the submission of formal drawings, the examiner has withdrawn the previous objection to the drawings in view of the submitted new drawings, but the new drawings necessitated a new objection to the drawings.

*Conclusion*

10. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1771


however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

atp

  
**ANDREW T. PIZIALI**  
**PATENT EXAMINER**

  
**TERREL MORRIS**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**